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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,955	04/02/2004	Ik-Hyeon Kwon	4518-2	8925
23117 7590 09/18/2008 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203				
EXAMINER				
MAKI, STEVEN D				
ART UNIT		PAPER NUMBER		
1791				
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09/18/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/815,955

Applicant(s)

KWON ET AL.

Examiner

Steven D. Maki

Art Unit

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

- 1) The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- 2) Claims 3-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 3, the description at the last three lines is confusing. In claim 3, it is unclear if the bobbin (in contrast to the axis) is hollow. It is unclear if claim 3 requires the bobbin to broadly have a "circumferential surface" or more narrowly a "cylindrical surface". It is unclear if claim 3 requires a step of winding the raw cord on the surface of the bobbin. Alternatively, it is unclear if claim 3 merely requires the raw cord to be wound about the bobbin. The description of "a bobbin ... winding a raw cord" is ambiguous because the bobbin is a storage means instead of a winding means.

- 3) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- 4) **Claims 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki et al (US 5,016,698) in view of Tanaka et al (US 4,698,194), Kurashige (US 3,345,446), Matsubayashi et al (US 3,007,228), Japan 609 (JP 05-163609), Matson et al (US 6911219) and Clifford et al (US 6,083,284).**

Iwasaki et al discloses making a PVA fiber cord for a pneumatic tire by spinning polyvinyl alcohol using a dry system, wet system or dry-wet system; passing the yarn

through a solidification bath of methanol or the like; drawing and further drawing the yarn under heat treatment; twisting the yarn to obtain a "cabling yarn" having a twisting number such as 31X31; plying the "cabling yarn" to produce a raw cord" such as a 2-ply "raw cord" having a denier (D) of 1500/2; **immersing the polyvinyl alcohol "raw cord" in a bath comprising crosslinking agent (e.g. aldehyde) and a solvent such as water or methyl alcohol (methanol)**; washing out extra crosslinking agent remaining between the cords or on the surface of the filament with water, alcohol or the like; then subjecting the polyvinyl alcohol fiber cord treated with the crosslinking agent to drying a heat treatment to cross link the crosslinking agent; then **immersing the crosslinked cord in a resorcin/formaldehyde/latex (RFL) series adhesive**; drying and subjecting the RFL treated cord to heat treatment. Iwasaki et al teaches that the crosslinking agent causes crosslinking reaction between OH groups or adjoining polyvinyl alcohol molecules to improve fatigue properties and resistances to compression, distortion, high temperature and hot water in the filament. Iwasaki et al teaches using a crosslinking agent such as aldehydes. See Table 1, col. 3 lines 18-22, col. col. 4 lines 55-68, col. 5 lines 1-29, col. 5 lines 41-46 and col. 5 lines 64-68. As an alternative to immersing the cord in a bath comprising crosslinking agent and solvent as described at col. 5 lines 4-29, Iwasaki et al teaches that the penetration of crosslinking agent can be carried out at a spinning step or a solidification step (col. 5 lines 30-55). Hence, Iwasaki et al substantially teaches the claimed method of making a crosslinked cord, but does not recite spinning the solution by passing it through an air gap of 5 to 50 mm.

As to claims 3-7, it would have been obvious to one of ordinary skill in the art to spin yarn in Iwasaki et al's process of making a crosslinked PVA cord by dissolving polyvinyl alcohol having a degree of polymerization of 1,000 to 7,000 and a degree of saponification of more than 97 mol% and spinning the solution by passing it through an air gap of 5 to 50 mm in length in a **dry and wet spinning** technique since (1) Iwasaki et al teaches that a dry wet spinning method may be used, (2) Tanaka et al, directed to a process for producing ultra high tenacity polyvinyl alcohol fiber, teaches forming a solution of completely (100%) saponified PVA having a degree of polymerization of at least 1500 and dry wet spinning filaments such that the distance ("air gap") between the face of the spinneret and the liquid level of the coagulating bath is 2-200 mm, preferably 3-20 mm and (3) Tanaka et al teaches that the dry wet spinning technique permits use of a high draw ratio to obtain improved properties.

Furthermore, it would have been obvious to one of ordinary skill in the art to crosslink Iwasaki et al's polyvinyl alcohol cord using a **crosslinker comprising aromatic aldehyde and acid catalyst** while adding alcohol since (1) Iwasaki et al teaches crosslinking the polyvinyl alcohol cord using a crosslinker such as aldehyde and (2) it is well known in the art of polyvinyl alcohol fibers to crosslink (acetalize) polyvinyl alcohol fibers using a liquid bath of aromatic aldehyde and acid catalyst as evidenced by Kurashige, Matsubayashi et al and Japan 609 (paragraph 17 of machine translation). Kurashige teaches that hot water resistance, which is desired by Iwasaki (col. 4 lines 55-68), is improved. Kurashige also teaches including methanol in the bath. As to claims 4 and 5, the secondary art (e.g. Kurashige) teaches using

methanol in the bath. As to claim 6, the secondary art (e.g. Kurashige) teaches using a small percentage (e.g. 2%) of the aromatic aldehyde. As to the specific type of aldehyde (claim 7), see col. 3 line 45 of Matsubayashi et al and paragraph 23 of machine translation of Japan 609.

With respect to the type of acid, Japan 609 teaches using an organic acid as a catalyst and acetic acid is taken as a well known organic acid per se. It would have been obvious to one of ordinary skill in the art to use "acetic acid" as the catalyst for the crosslinker since Matson et al teaches that it is known per se that acetic acid may be used as a catalyst for acetalization reaction for polyvinyl alcohol.

With respect to a bobbin, it would have been obvious to one of ordinary skill in the art to treat the raw PVA cord with the liquid crosslinker with a bobbin as claimed since Clifford et al suggests evenly treating yarn packages with liquid such as dye liquid using an apparatus comprising a vessel 21 (container) for holding the liquid and a stack of loads 17 placed on holders 17 wherein the load (package) is formed by winding a yarn onto a perforated cylindrical core formed as a cylindrical bobbin and the bobbins are mounted on a spindle (the holder 17).

Remarks

5) Applicant's arguments with respect to claims 3-7 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 6-12-08 have been fully considered but they are not persuasive.

Applicant argues that the rejection is traversed because a prima facie case of obviousness has not been established as evidenced by the number of applied references. "The criterion, however, is not the number of references, but what they would have meant to a person of ordinary skill in the filed of the invention." In re Gorman 18 USPQ2d 1885, 1888 (Fed. Cir. 1991) (affirmance of thirteen reference rejection).

6) No claim is allowed.

7) Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven D. Maki/
Primary Examiner, Art Unit 1791

Steven D. Maki
September 15, 2008